

How'd They Do That?

LIKE MILLIONS OF OTHER FASCINATED VIEWERS, I watched the Discovery Channel television series *Planet Earth* in awe. The spectacular imagery was unforgettable. What I found particularly intriguing was the additional commentary at the end of each hour of the series, in which the techniques and technology used to attain the marvelous footage were described in enough detail to satisfy some of my technical nature. But—you knew there was going to be a “but” here—I must say that I was a bit surprised at the end of the “Oceans” episode, only to hear about the heroic efforts of the underwater camera crew who swam dangerously close to the whitetip sharks. The other episodes included a discussion of a gimbaled, helicopterborne camera system and a balloon-based platform for cruising within inches of treetops. The message in these technical clips was clear: it’s hard to film nature in the desert and in remote mountain environs. But the message in the ocean episode was very different: it’s dangerous to film nature in the ocean. The more I thought about this, the more I realized that this is just one more instance of our need to convey to the outside world just how difficult it is to conduct research and operations in the oceans.

Ours is an extraordinarily difficult environment in which to do the simplest of activities, yet we continually understate the challenges we face. We’ve all marveled at the technical accomplishments of driving a roving platform over the surface of Mars. Try doing so over the ocean bottom without the capability to transmit a radio-frequency signal over even a few meters. Sure, space weather can permanently knock out a satellite-borne system. But what about dealing with a “simple” battery housing under pressure in excess of 10,000 pounds per square inch—and doing so at temperatures near freezing or above 300°C, in a dark, saline environment? While you’re at it, consider the power that you will need to send a simple acoustic data stream from a depth of 4 km (interestingly, a distance equivalent to what a polar-orbiting satellite covers in a half a second), not to mention dealing with powerful ocean currents, waves, and tides, as well as the interesting mitigations needed to protect mooring lines from shark bites, microbial fouling, ship’s propellers, and high-seas pirates. I think you get my point.

So why is it that we oceanographers don’t get any respect for the exquisite skill with which we overcome these challenges? Part of the answer might lie in our “can-do” spirit. When we’re 1,000 km from shore, and our \$32,000-a-day cruise depends on getting one last profile to 4,000 m depth, we’ll find the duct tape, silicone sealant, and dry nitrogen to make things work. Complaining about lack of resources won’t work; besides, nobody likes a whiner at sea. There’s also no time to wait for a supplemental appropriation or a renewal proposal. As a result, our reputation for resourcefulness and penny-pinching becomes more of a *modus operandi*.

Don’t get me wrong. This wonderful trait of our oceanographic community is also a great source of pride. It’s just that one day, I’d really like to see some filmmaker expound on the remarkable feat of technology it is to get the data and observations that we need so desperately—whether there are sharks in the water or not!



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